

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

REC'D 13 DEC 2005
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Applicant's or agent's file reference EH-0140	FOR FURTHER ACTION See Form PCT/PEA/416																									
International application No. PCT/US2004/029236	International filing date (day/month/year) 09.09.2004	Priority date (day/month/year) 11.09.2003																								
International Patent Classification (IPC) or national classification and IPC B22F3/105, B29C33/10, B22F5/00																										
Applicant EX ONE CORPORATION																										
<ol style="list-style-type: none"> 1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36. 2. This REPORT consists of a total of 10 sheets, including this cover sheet. 3. This report is also accompanied by ANNEXES, comprising: <ol style="list-style-type: none"> a. <input type="checkbox"/> sent to the applicant and to the International Bureau) a total of sheets, as follows: <ul style="list-style-type: none"> <input type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions). <input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box. b. <input type="checkbox"/> (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions). 																										
<ol style="list-style-type: none"> 4. This report contains indications relating to the following items: <table style="width: 100%; border: none;"> <tr> <td style="width: 10%;"><input checked="" type="checkbox"/></td> <td style="width: 15%;">Box No. I</td> <td>Basis of the opinion</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. II</td> <td>Priority</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td>Box No. III</td> <td>Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td>Box No. IV</td> <td>Lack of unity of invention</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td>Box No. V</td> <td>Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. VI</td> <td>Certain documents cited</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. VII</td> <td>Certain defects in the international application</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td>Box No. VIII</td> <td>Certain observations on the international application</td> </tr> </table> 			<input checked="" type="checkbox"/>	Box No. I	Basis of the opinion	<input type="checkbox"/>	Box No. II	Priority	<input checked="" type="checkbox"/>	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability	<input checked="" type="checkbox"/>	Box No. IV	Lack of unity of invention	<input checked="" type="checkbox"/>	Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement	<input type="checkbox"/>	Box No. VI	Certain documents cited	<input type="checkbox"/>	Box No. VII	Certain defects in the international application	<input checked="" type="checkbox"/>	Box No. VIII	Certain observations on the international application
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Date of submission of the demand 24.06.2005	Date of completion of this report 13.12.2005																									
Name and mailing address of the international preliminary examining authority: European Patent Office - P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Tx: 31 651 epo nl Fax: +31 70 340 - 3016	Authorized Officer Rischard, M Telephone No. +31 70 340-																									



**INTERNATIONAL PRELIMINARY REPORT
ON PATENTABILITY**

International application No.
PCT/US2004/029236

Box No. I Basis of the report

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
- ☐ This report is based on translations from the original language into the following language , which is the language of a translation furnished for the purposes of:
- ☐ international search (under Rules 12.3 and 23.1(b))
 - ☐ publication of the international application (under Rule 12.4)
 - ☐ international preliminary examination (under Rules 55.2 and/or 55.3)
2. With regard to the **elements*** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

Description, Pages

1-12 as originally filed

Claims, Numbers

1-86 as originally filed

Drawings, Sheets

1-4 as originally filed

- ☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing
3. ☐ The amendments have resulted in the cancellation of:
- ☐ the description, pages
 - ☐ the claims, Nos.
 - ☐ the drawings, sheets/figs
 - ☐ the sequence listing (*specify*):
 - ☐ any table(s) related to sequence listing (*specify*):
4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
- ☐ the description, pages
 - ☐ the claims, Nos.
 - ☐ the drawings, sheets/figs
 - ☐ the sequence listing (*specify*):
 - ☐ any table(s) related to sequence listing (*specify*):

* If item 4 applies, some or all of these sheets may be marked "superseded."

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Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

1. The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non-obvious), or to be industrially applicable have not been examined in respect of:
- ☐ the entire international application,
 - ☒ claims Nos. 17, 18, 44, 45
because:
 - ☐ the said international application, or the said claims Nos. relate to the following subject matter which does not require an international preliminary examination (specify):
 - ☐ the description, claims or drawings (*indicate particular elements below*) or said claims Nos. are so unclear that no meaningful opinion could be formed (*specify*):
 - ☐ the claims, or said claims Nos. are so inadequately supported by the description that no meaningful opinion could be formed.
 - ☒ no international search report has been established for the said claims Nos. 17, 18, 44, 45
 - ☐ the nucleotide and/or amino acid sequence listing does not comply with the standard provided for in Annex C of the Administrative Instructions in that:
 - the written form ☐ has not been furnished
 - ☐ does not comply with the standard
 - the computer readable form ☐ has not been furnished
 - ☐ does not comply with the standard
 - ☐ the tables related to the nucleotide and/or amino acid sequence listing, if in computer readable form only, do not comply with the technical requirements provided for in Annex C-*bis* of the Administrative Instructions.
 - ☐ See separate sheet for further details

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Box No. IV Lack of unity of invention

1. ☒ In response to the invitation to restrict or pay additional fees, the applicant has:
- ☐ restricted the claims.
 - ☐ paid additional fees.
 - ☐ paid additional fees under protest.
 - ☒ neither restricted nor paid additional fees.
2. ☐ This Authority found that the requirement of unity of invention is not complied with and chose, according to Rule 68.1, not to invite the applicant to restrict or pay additional fees.
3. This Authority considers that the requirement of unity of invention in accordance with Rules 13.1, 13.2 and 13.3 is
- ☐ complied with.
 - ☒ not complied with for the following reasons:
see separate sheet
4. Consequently, this report has been established in respect of the following parts of the international application:
- ☐ all parts.
 - ☒ the parts relating to claims Nos. 1-16,19-43,46-86 .

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	13,14,43,56,57,75
	No: Claims	1-12,15,16,19-42,46-55,58-74,76-86
Inventive step (IS)	Yes: Claims	13,14,43
	No: Claims	1-12,15,16,19-42,46-55,58-74,76-86,56,57,75
Industrial applicability (IA)	Yes: Claims	1-16,19-43,46-86
	No: Claims	

2. Citations and explanations (Rule 70.7):

see separate sheet

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Box No. VIII Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

see separate sheet

Re Item IV

Lack of unity of invention

The separate inventions/groups of inventions are:

Claims 1-16,19-43,46-86

A method for manufacturing a mold with multiple integrated vent conducts by a layered process, with a reduced electronic processing time

Claims 17,18,44,45

A method for manufacturing a mold with integrated vents allowing an easy removal of the molded part and reducing the risk of vent blockage

They are not so linked as to form a single general inventive concept (Rule 13.1 PCT) for the following reasons:

Document EP-0908286-A1 (D3) is considered to be the closest prior art. The difference between the disclosure of D3 and the two inventions can be defined as follows:

Claims 1-16,19-43,46-86: The contribution over the prior art (special technical feature) is that the vents have a non-circular cross-section. The technical effect is a substantially reduced processing time when numerous vents have to be represented in an electronic file. The problem to be solved is to provide a method for manufacturing a mold with numerous integrated vents by a layered process, with a reduced processing time of the electronic file.

Claims 17,18,44,45: The contribution over the prior art (special technical feature) is that the vents are oriented parallel to the opening of the mold. The technical effect is an easy removal of the molded part with a reduced risk of blockage of the vents by the EPS beads. The problem to be solved is to provide a mold with integrated vents allowing an easy removal of the molded part and reducing the risk of blocking the vents by escaping EPS beads.

Since the special technical effects are neither identical nor solve a similar technical problem, the two groups of claims are not linked by a single inventive concept.

Re Item V

**Reasoned statement with regard to novelty, inventive step or industrial applicability;
citations and explanations supporting such statement**

The following documents are referred to in this communication:

- D1 : US 2002/057627 A1 (SCHUBERT KLAUS ET AL) 16 May 2002 (2002-05-16)
D2 : EP 0 908 286 A1 (FRAUNHOFER-GESELLSCHAFT ZUR FOERDERUNG DER ANGEWANDTEN
FORSCHUNG E.V) 14 April 1999 (1999-04-14)
D3 : DE 199 37 315 A1 (MUELLER WEINGARTEN AG) 22 February 2001 (2001-02-22)
D4 : TOBIN J ET AL: "RAPID STEREOLITHOGRAPHY MOLDS" MOTOROLA TECHNICAL
DEVELOPMENTS, MOTOROLA INC. SCHAUMBURG, ILLINOIS, US, vol. 15, 1 May 1992
(1992-05-01), page 38, XP000305734 ISSN: 0887-5286
D5 : EP 0 868 955 A (PIRELLI PNEUMATICI SOCIETA PER AZIONI) 7 October 1998 (1998-10-07)

1 INDEPENDENT CLAIM 1

The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claim 1 is not new in the sense of Article 33(2) PCT. Document D1 discloses (the references in parentheses applying to this document):

A method for producing a micromixer including fluid conduction vents with a width of less than 0,25mm and a rectangular cross-section of variable length along its centerline, [fig.1]. The article is produced by layered laser welding of metal powder, respectively layered hardening of plastic material [claims 1-8].

2 DEPENDENT CLAIMS 2-12,15-16,19-37

Dependent claims 2-12,15-16 and 19-37 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of novelty and/or inventive step (Article 33(2) and (3) PCT) (see documents D1 to D5 and the citation passages of the international search report).

3 DEPENDENT CLAIM 13

The subject-matter of claim 13 differs from the document D1 through the fact that the manufacturing method is applied to an EPS mold. In the light of description and figure 1, this claim is interpreted in the sense that the process is applied to a mold containing a large number of vents with a non-circular cross-section, which leads to a significant reduction of the electronic processing time during manufacturing.

In view of the prior art on file, this technical effect cannot be seen as obvious and therefore claim 13 fulfills the requirements of Art. 33(2) and (3) PCT concerning novelty and inventive step.

4 DEPENDENT CLAIM 14

Claim 14 is dependent on claim 13 and as such also meets the requirements of the PCT with respect to novelty and inventive step.

5 INDEPENDENT CLAIMS 38-42

The subject-matter of product by process claims 38-42 is not new or inventive as the respective products are either disclosed or rendered obvious by the available prior art (see document D1 to D5 and the respective citations of the international search report)

It is pointed out that a claim which defines a product in terms of a process by which the product is made, is directed to the product per se. (see also Guidelines PCT (ISPE/1, published on 11/03/2004), Part II, Chapter 5, § 5.26))

6 INDEPENDENT CLAIM 43

The subject-matter of product by process claim 43 also meets the requirements of the PCT for novelty and inventive step, for the following reasons:

Claim 43 differs from the document D1 by the fact that the vent is part of an EPS mold. In

the light of the description and figure 1, claim 43 is interpreted such as a large number of vents of non-circular cross-section are integrated into a mold, thus reducing the processing time of the electronic files during manufacturing. This effect is neither disclosed nor rendered obvious by any of the documents on file.

6 INDEPENDENT CLAIMS 46,77-79,81-86

Notwithstanding the clarity objections under item VIII, the subject-matter of independent claims 46,77-79 and 81-86 differs from the document D1 through the fact that the vents have a non-straight center-line, respectively are branched or have different cross-sectional shapes. However, these are usual design options from which the skilled person would choose in order to solve the technical problem, without using an inventive step [see also document D3; fig.2, claims 1-4].

7 DEPENDENT CLAIMS 47-70,80

Dependent claims 47-70 and 80 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of novelty and/or inventive step (Article 33(2) and (3) PCT) (see documents D1 to D5 and the citation passages of the international search report).

8 INDEPENDENT CLAIMS 71-76

The subject-matter of product by process claims 71-76 is not new or inventive as the respective products are either disclosed or rendered obvious by the available prior art (see document D1 to D5 and the respective citations of the international search report)

Re Item VIII

Certain observations on the international application

1. The terms "small width fluid conduction vent" used in claims 1-6,9-12,17,18,23,24,25,32-34,46-49,52-55,77,79,80,81,82 is unclear according to Art. 6 PCT, as it leaves the reader in doubt as to the actual size of the vent.

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2. Product claims 38-43, 71-76, 78, 83-86 have been defined in terms of a manufacturing process. These claims are admissible only if the product as such fulfill the requirements for patentability, i.e. inter alia that they are new and inventive (Art. 33(2) and (3) PCT). A product is not rendered novel merely by the fact that it is produced by means of a new process (see also Guidelines PCT (ISPE/1, published on 11/03/2004), Part II, Chapter 5, § 5.26)).